Cambio climático y disponibilidad de recursos

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La economía de agua de riego

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PESETA (JRC)

Adaptation (DG Agri)

PICCMAT (6th FP)

CIRCE (6th FP)

SWAP (6th FP)

ClimateCost (7th FP)

MEDROPLAN (EuropeAid, MEDA Water)

- For the last 10,000 years we have been living in a remarkable stable climate that allowed the whole of the human development to take place
- In all that time, though the medieval warming and the Little Ice Age, there was only a variation of 1ºC
- Now we see the potential for sudden change of between 2 and 6ºC – **We just don't know what the world is like at those temperatures**, we have no idea if we can live in it

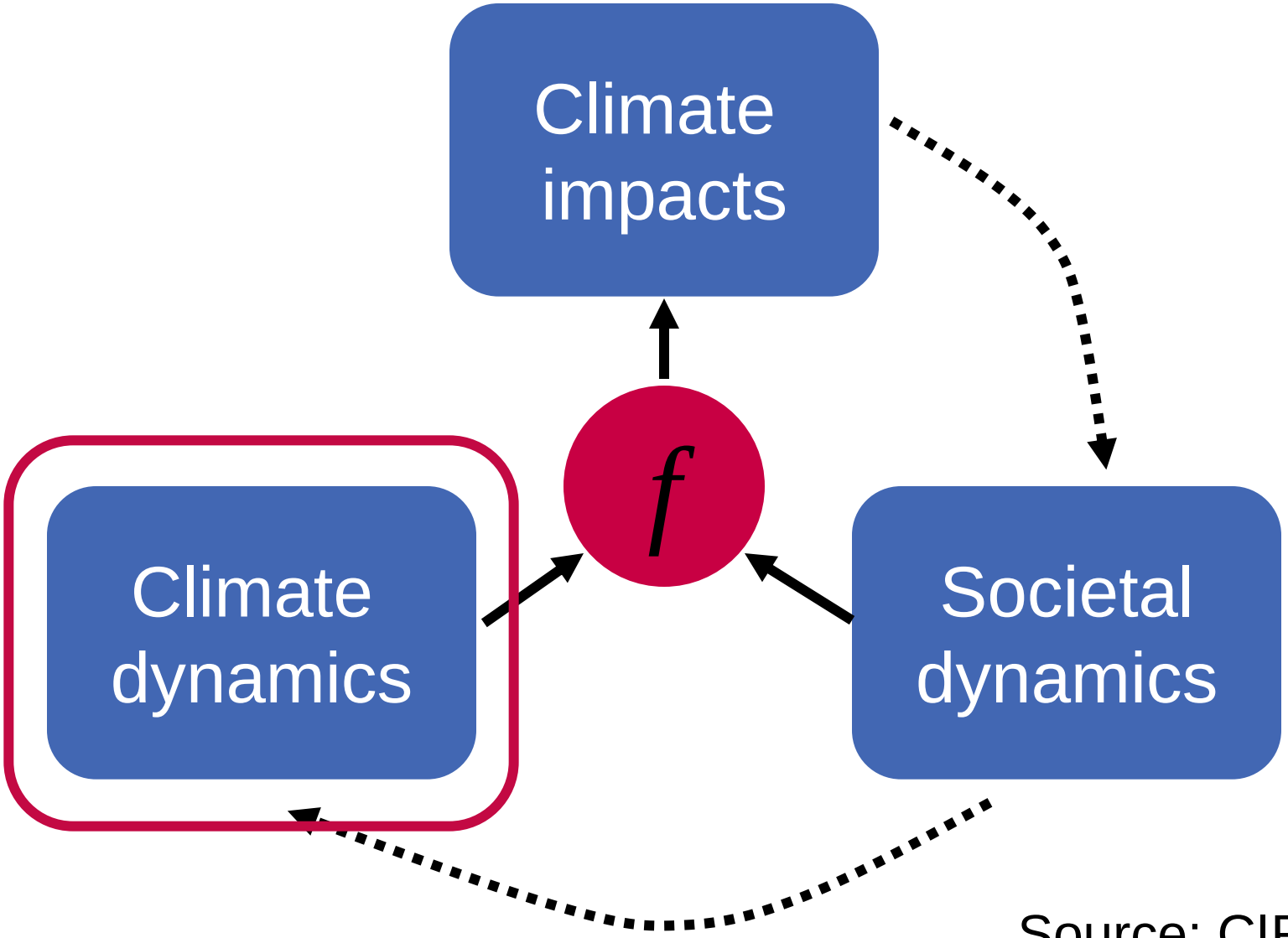
Adapted from: Robert Corell, The Guardian, Oct 2007

Production in a changing climate

- Objective: discussion

1. **Critical thinking: What does climate change mean for production?**
   - Complex outlook, multiple dimensions
   - Challenges and opportunities
2. **Solutions: What is the best future we can hope for?**
   - Focus on policy integration

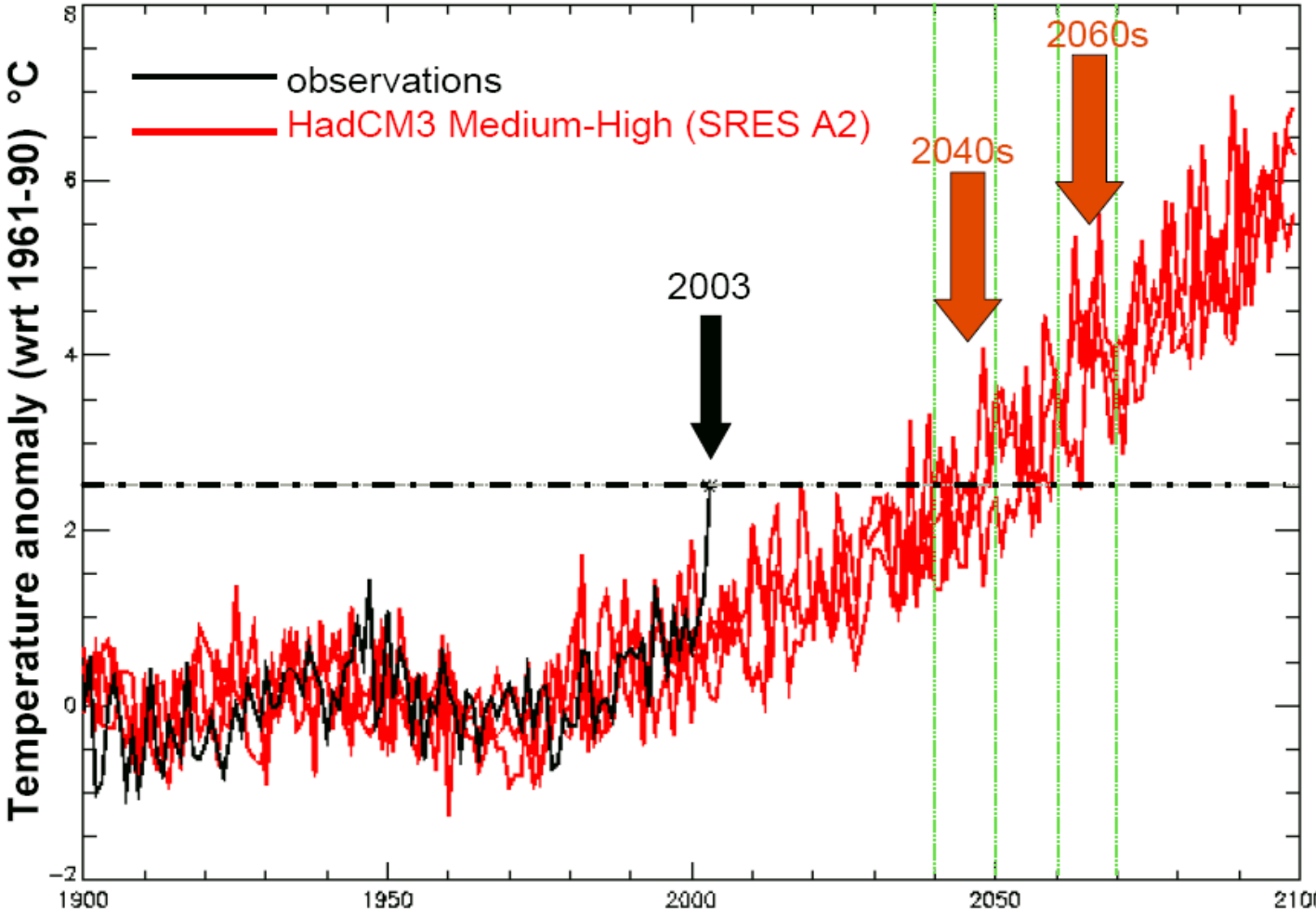
Rethinking climate impacts



Source: CIRCE

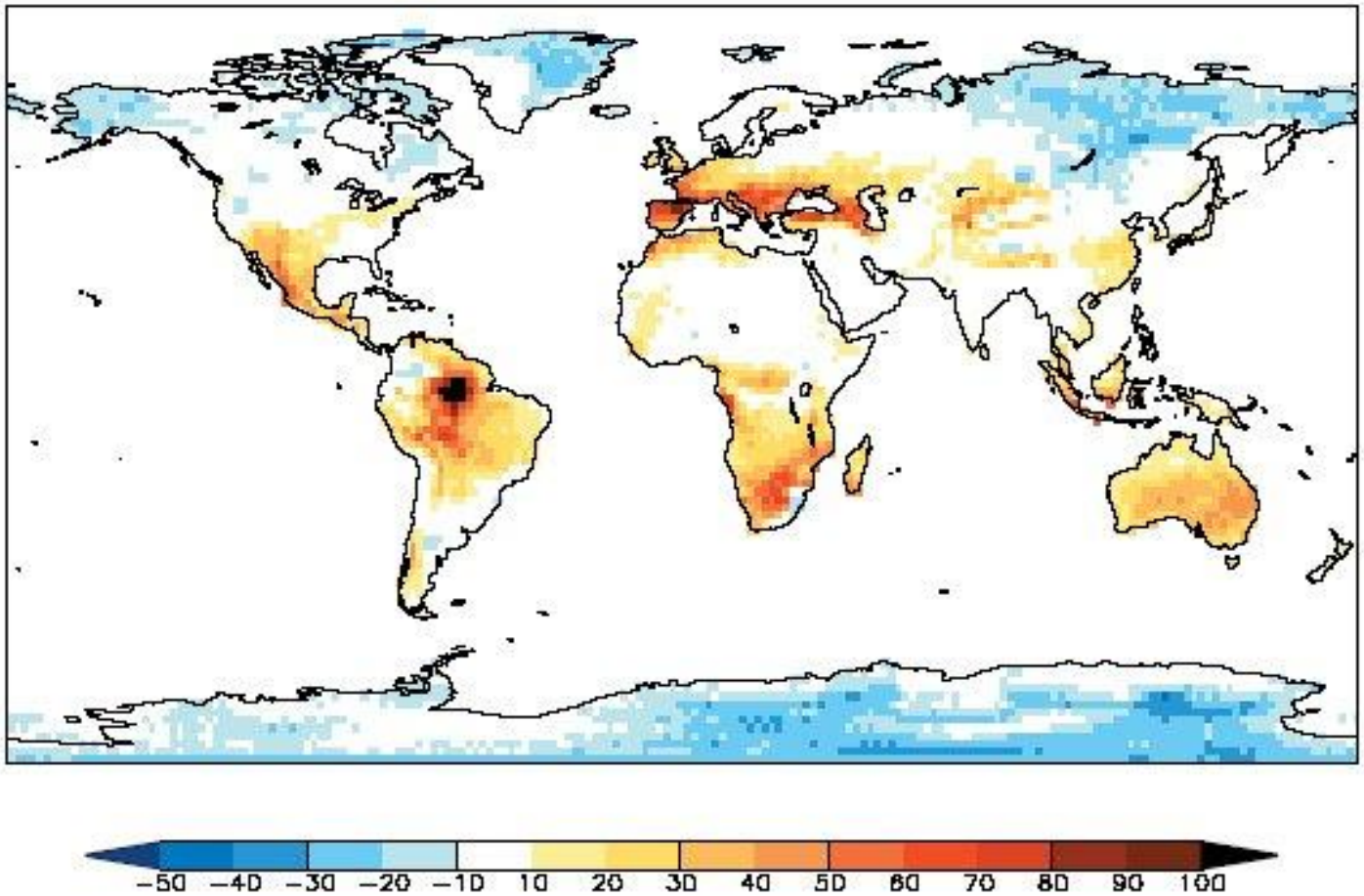
Climate dynamics

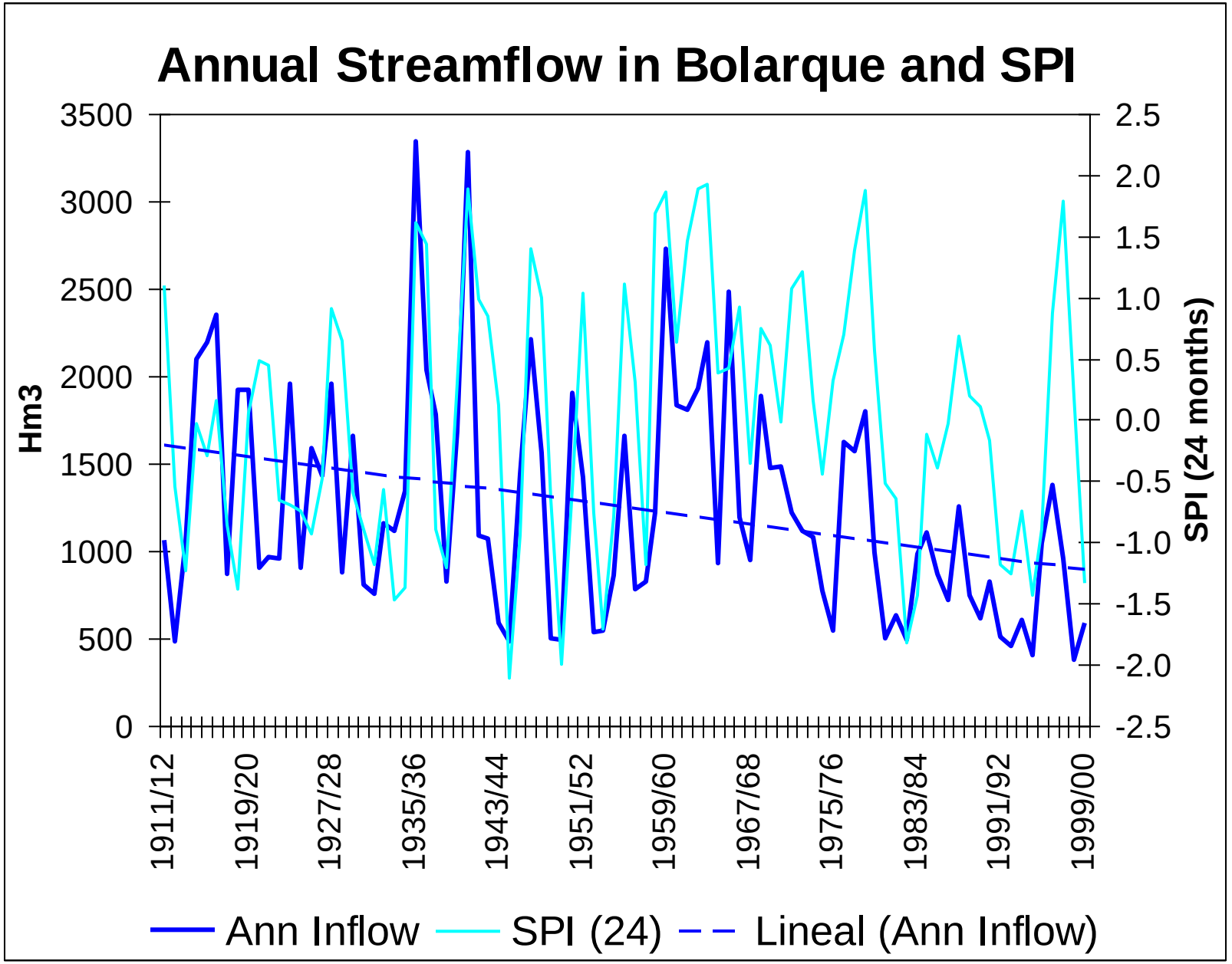
Observed and projected warming in the EU
Source: Stott et al. 2004, Hadley Centre



More extreme events

Projected changes in drought risk (%)
under the A1B MPI 2070-2100 scenario

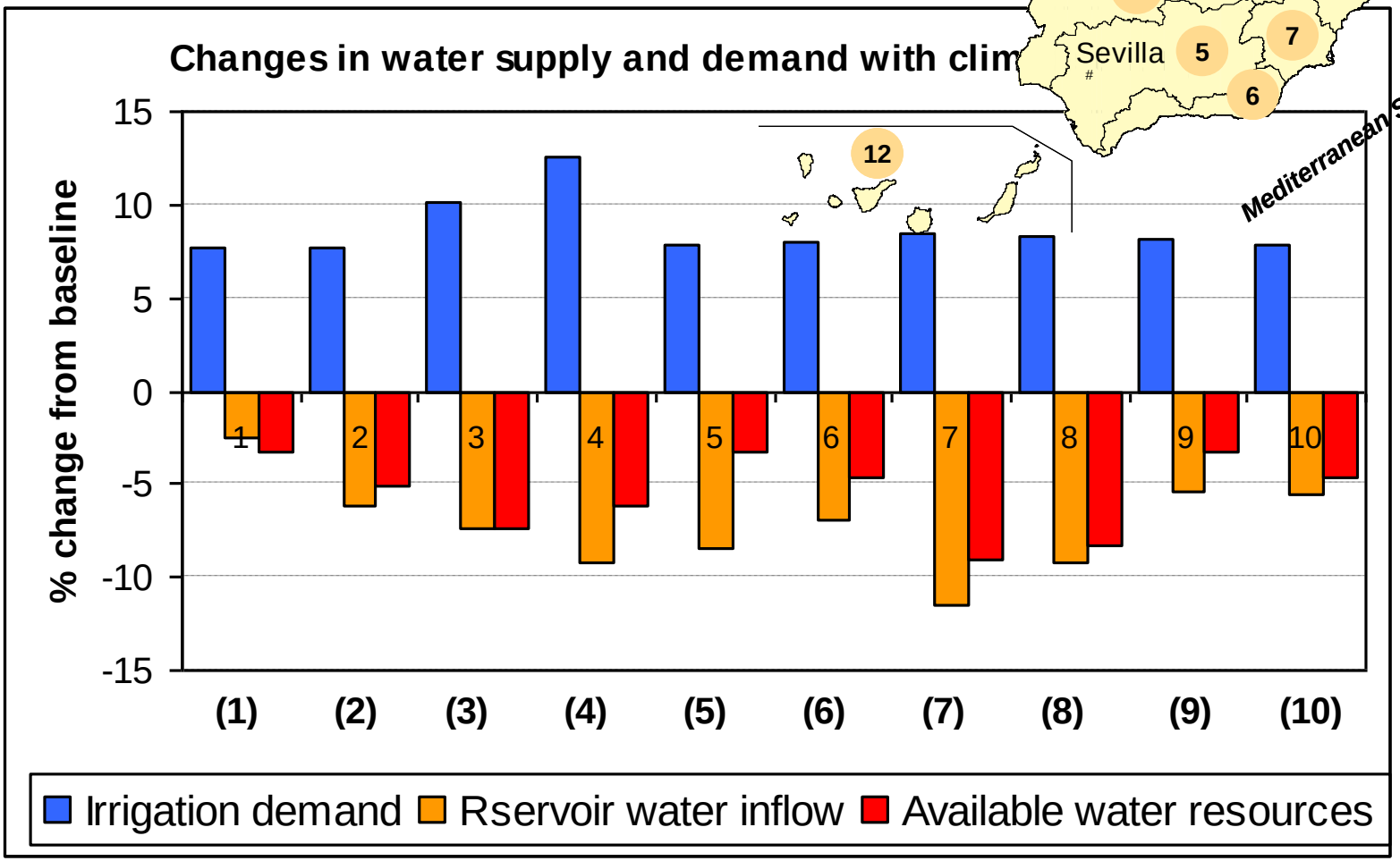




Source: Iglesias et al., 2007

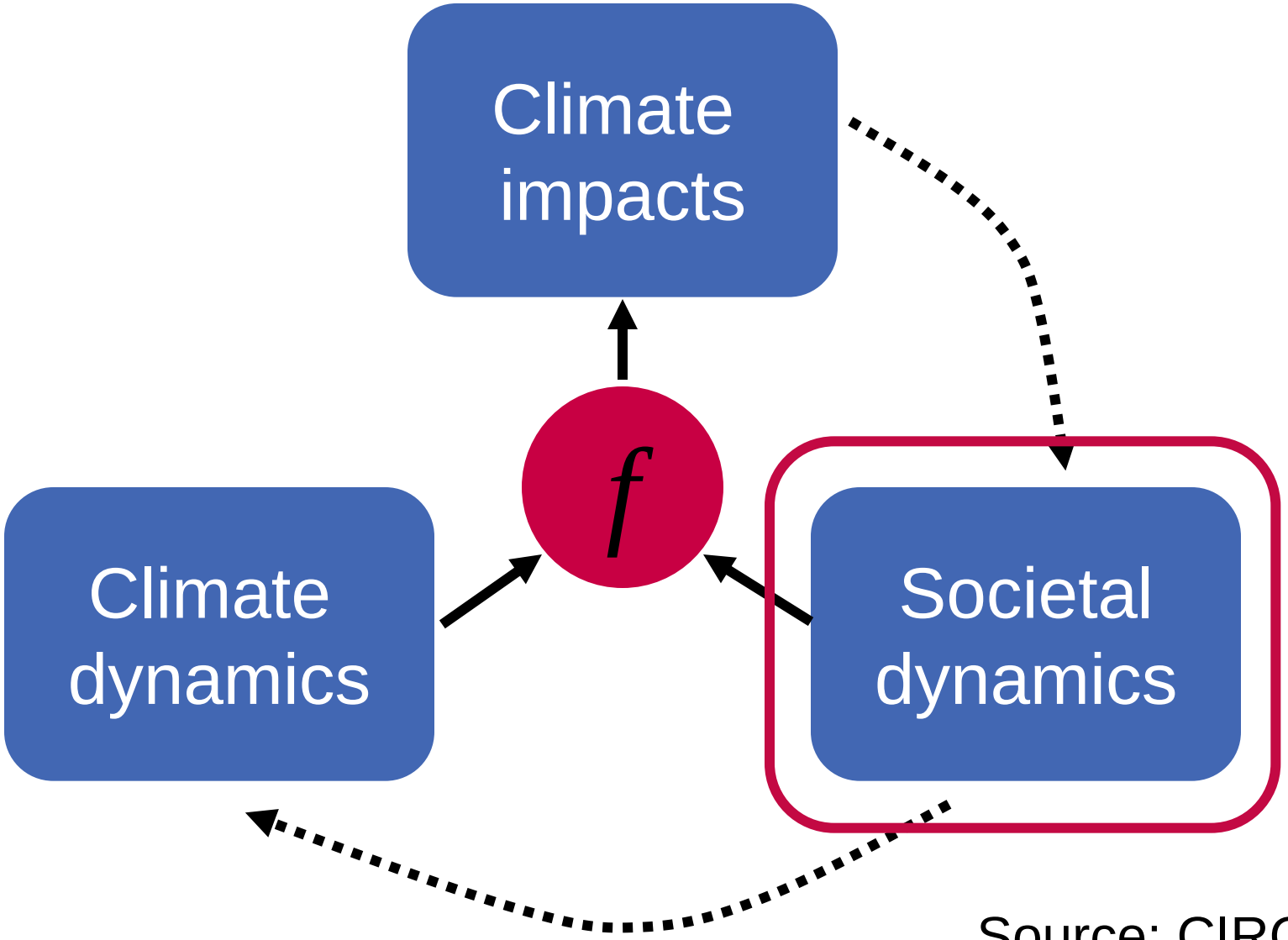
1. Scenarios:

Water supply and demand



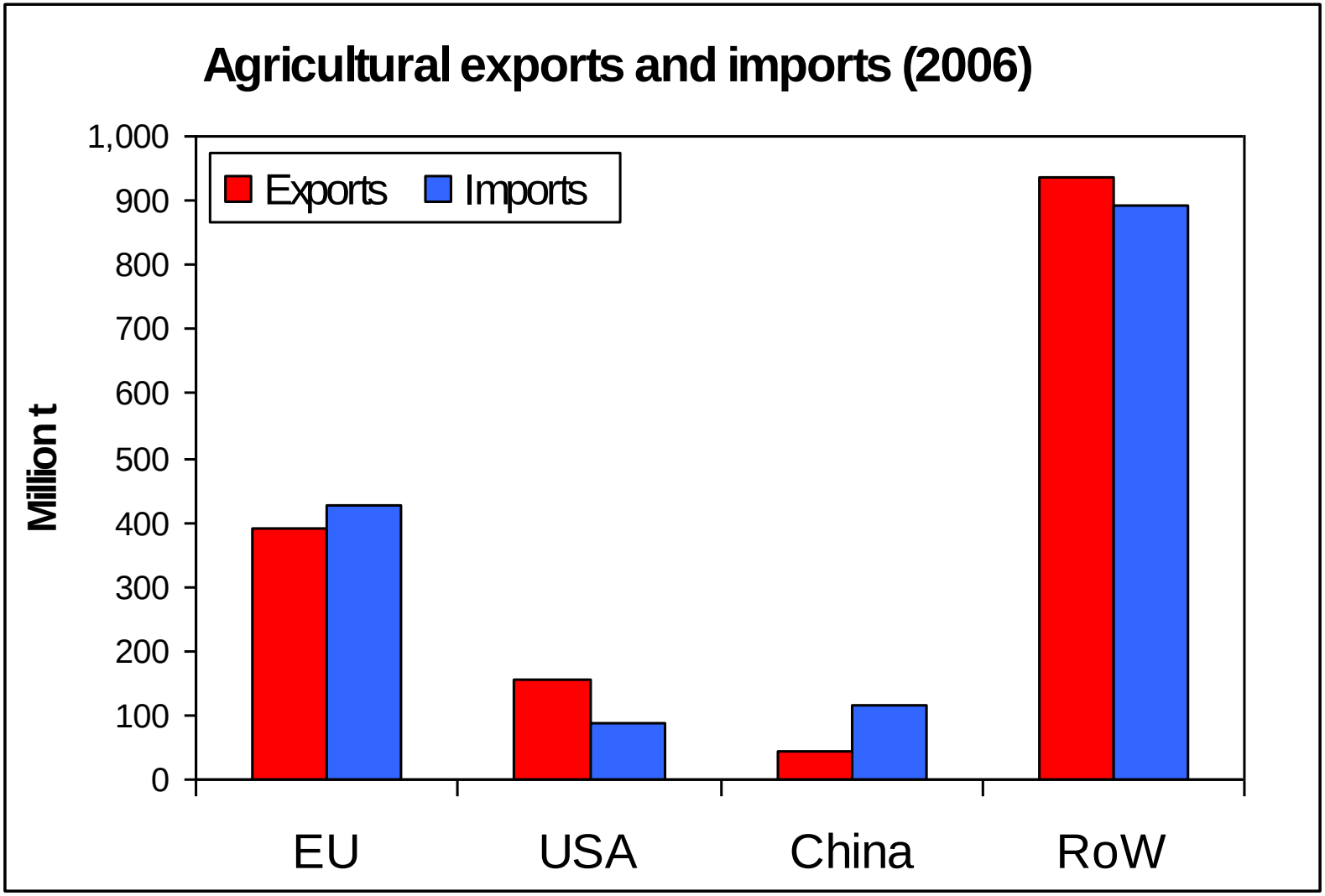
Iglesias et al. 2008

Rethinking climate impacts



Source: CIRCE

Global scale



2. Local realities (vulnerabilities)

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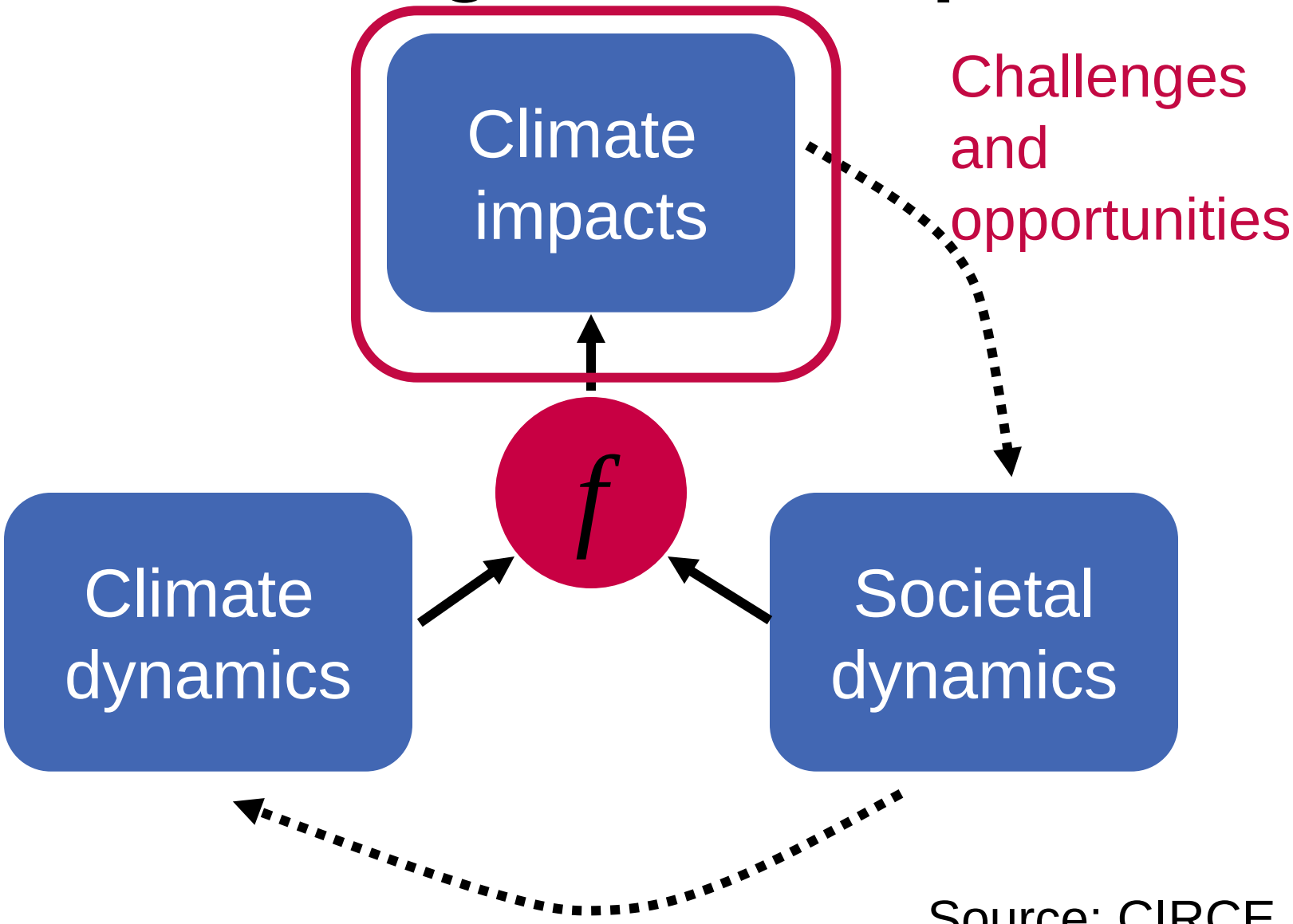
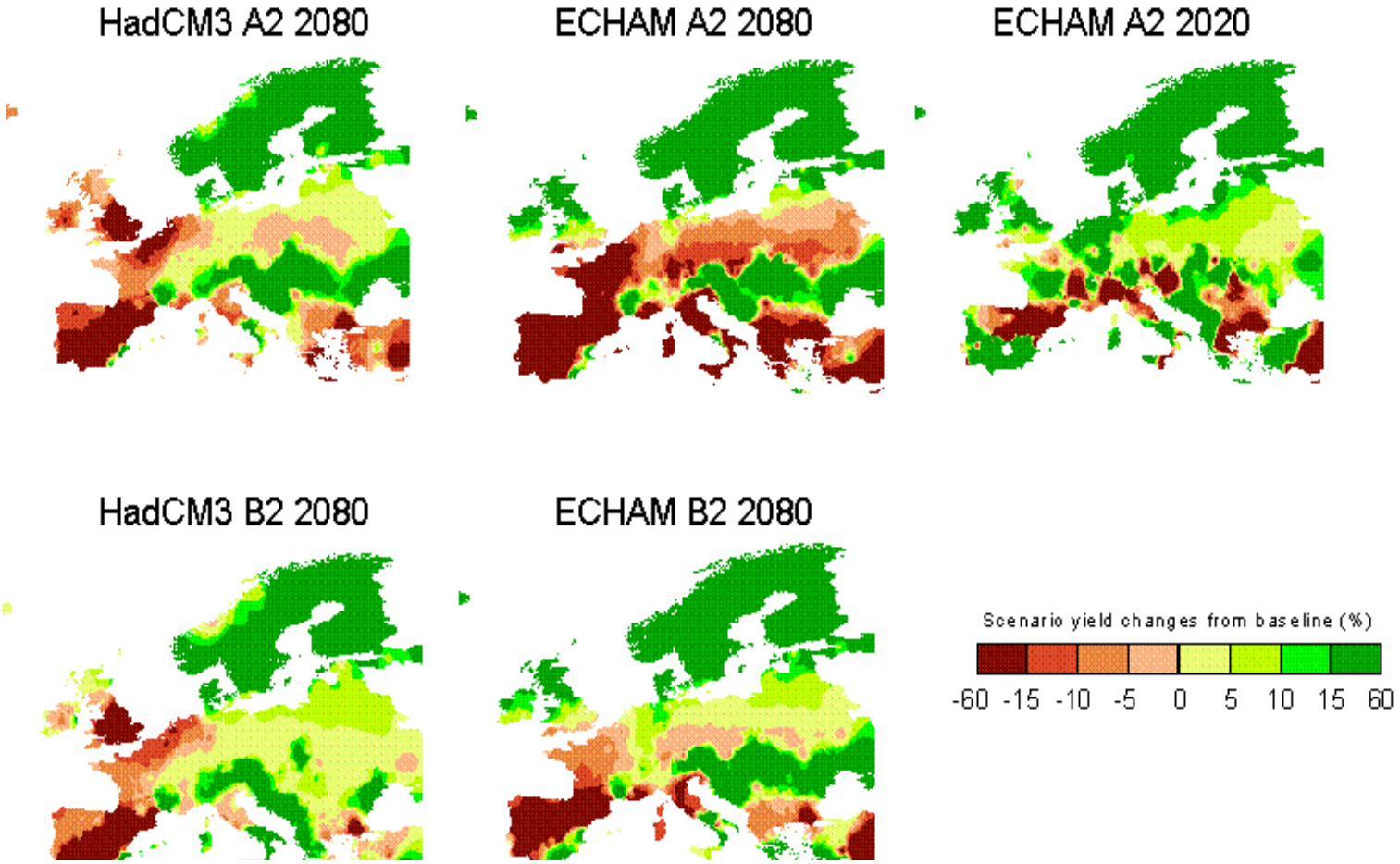
Rethinking climate impacts



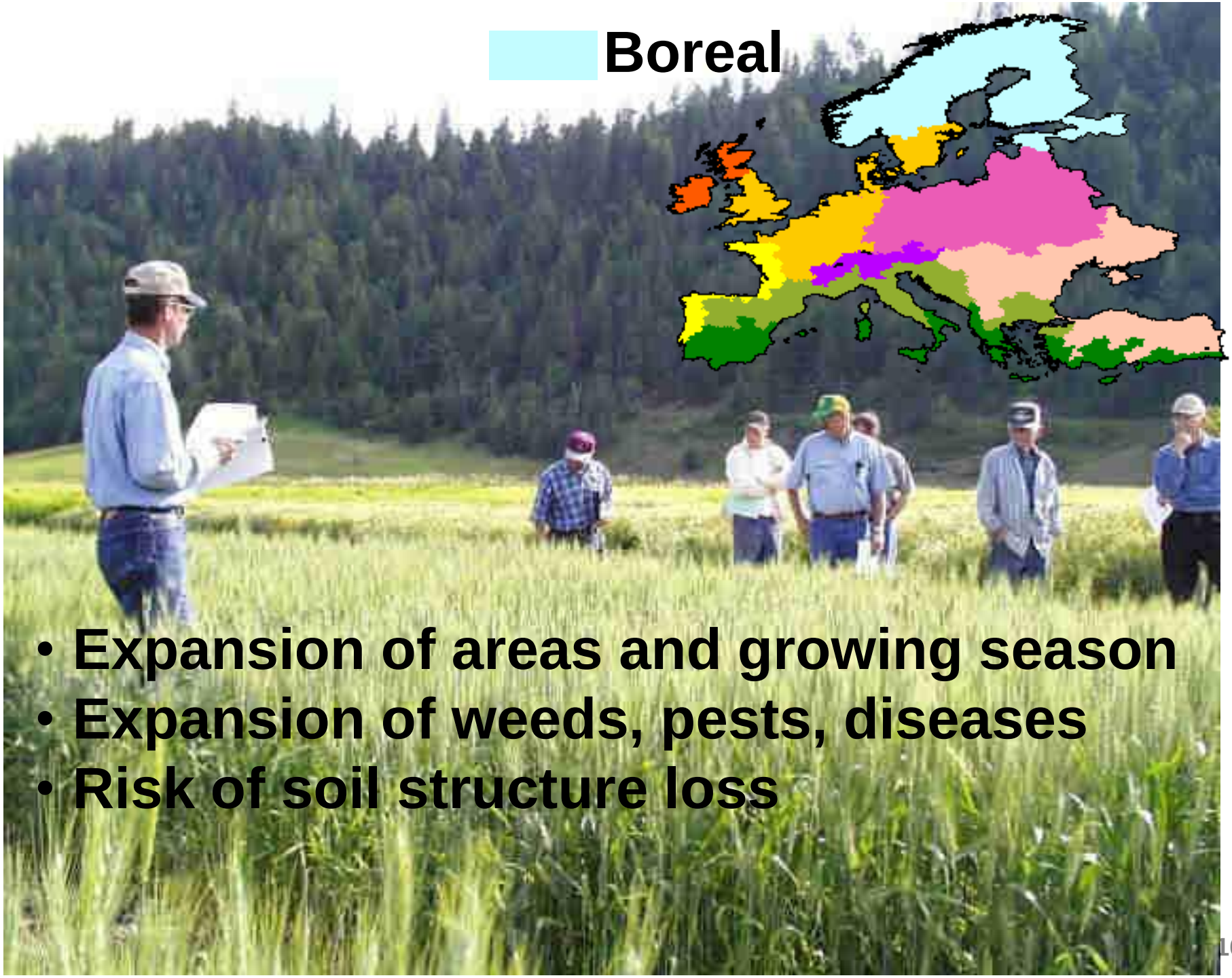
Source: CIRCE

Challenges and opportunities

Regional disparities



Crop yield changes under the HadCM3/HIRHAM A2 and B2 scenarios for the 2080s and for the ECHAM4/ RCA3 A2 and B2 scenarios for the 2080s and ECHAM4/ RCA3 A2 scenario for the 2020s compared to baseline (Iglesias et al. 2007)

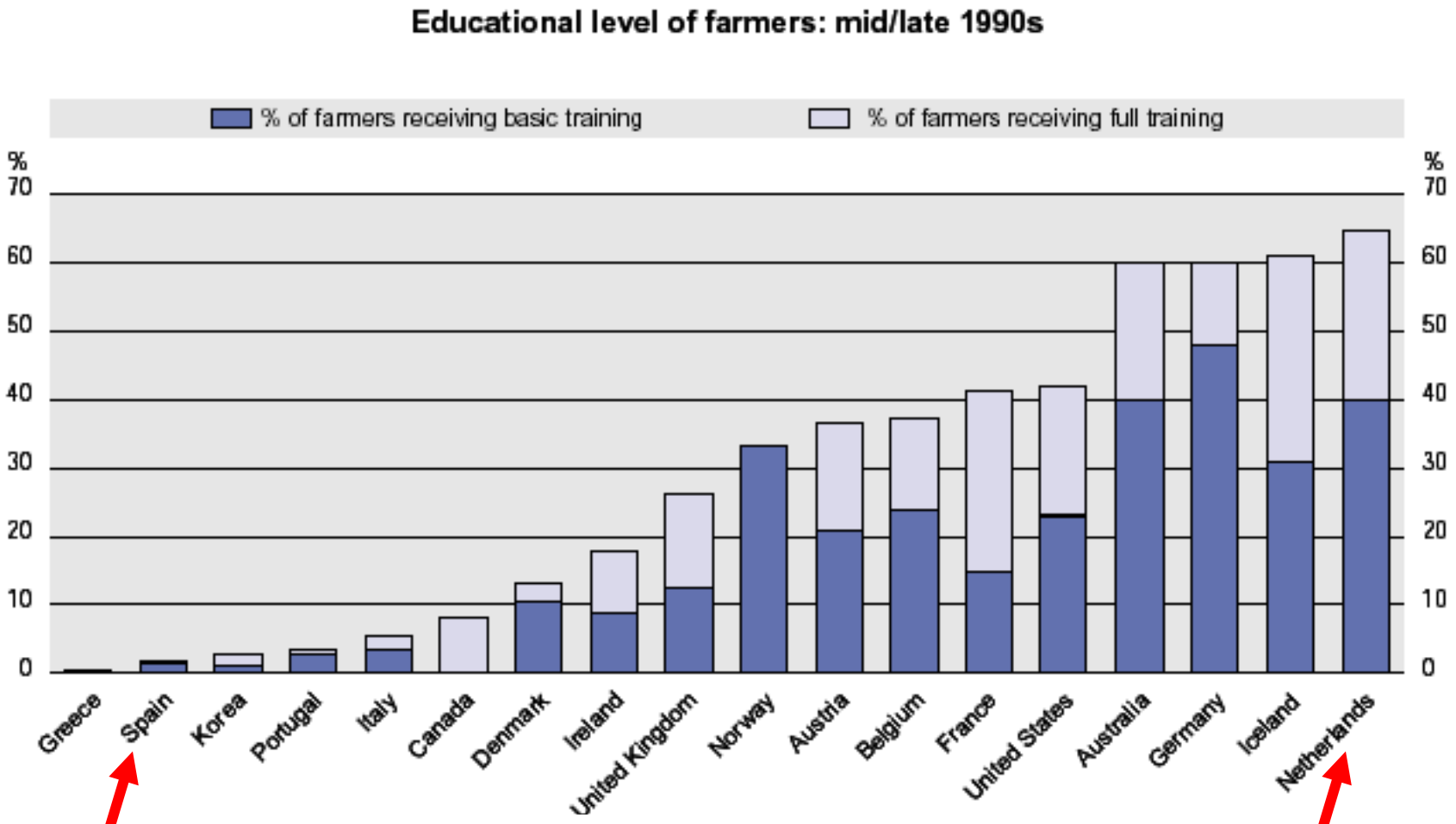


- Expansion of areas and growing season
- Expansion of weeds, pests, diseases
- Risk of soil structure loss

- Sea level rise
- Floods, water-logging
- Summer drought
- Environmental policy determines the opportunities

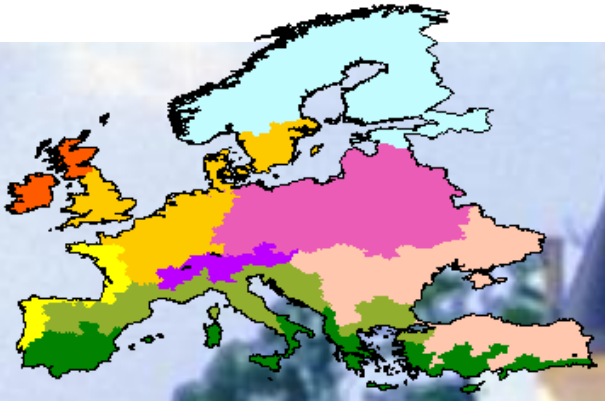
3. Useful knowledge

The role of the human capital, Gary Becker (Nobel Price, 1992)



Fuente: OECD

http://www.oecd.org/dataoecd/0/9/1916629.pdf

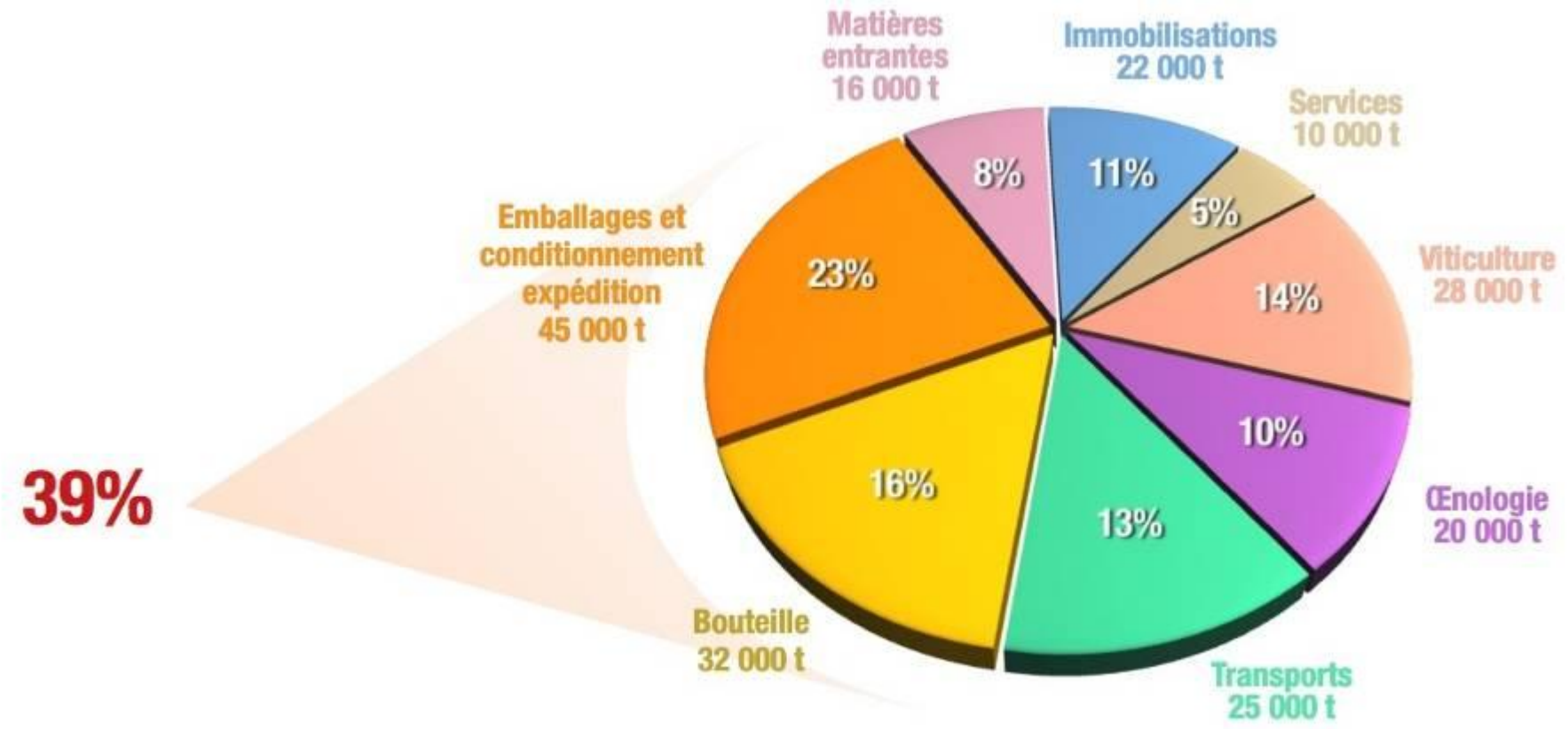


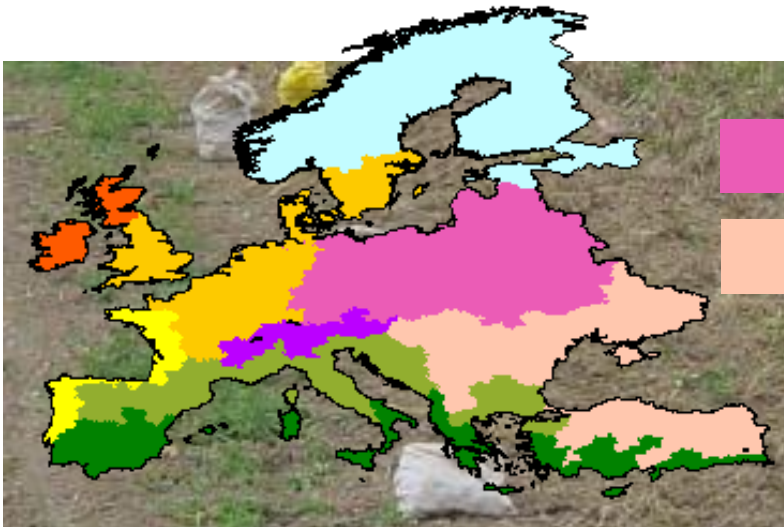
Atlantic S

- Decline of high quality crops
- Regulations may limit opportunities

Bordeaux red: Cabernet Sauvignon, Cabernet franc, Merlot, Petit Verdot, Carménère, Malbec

Balance Carbono en Champagne

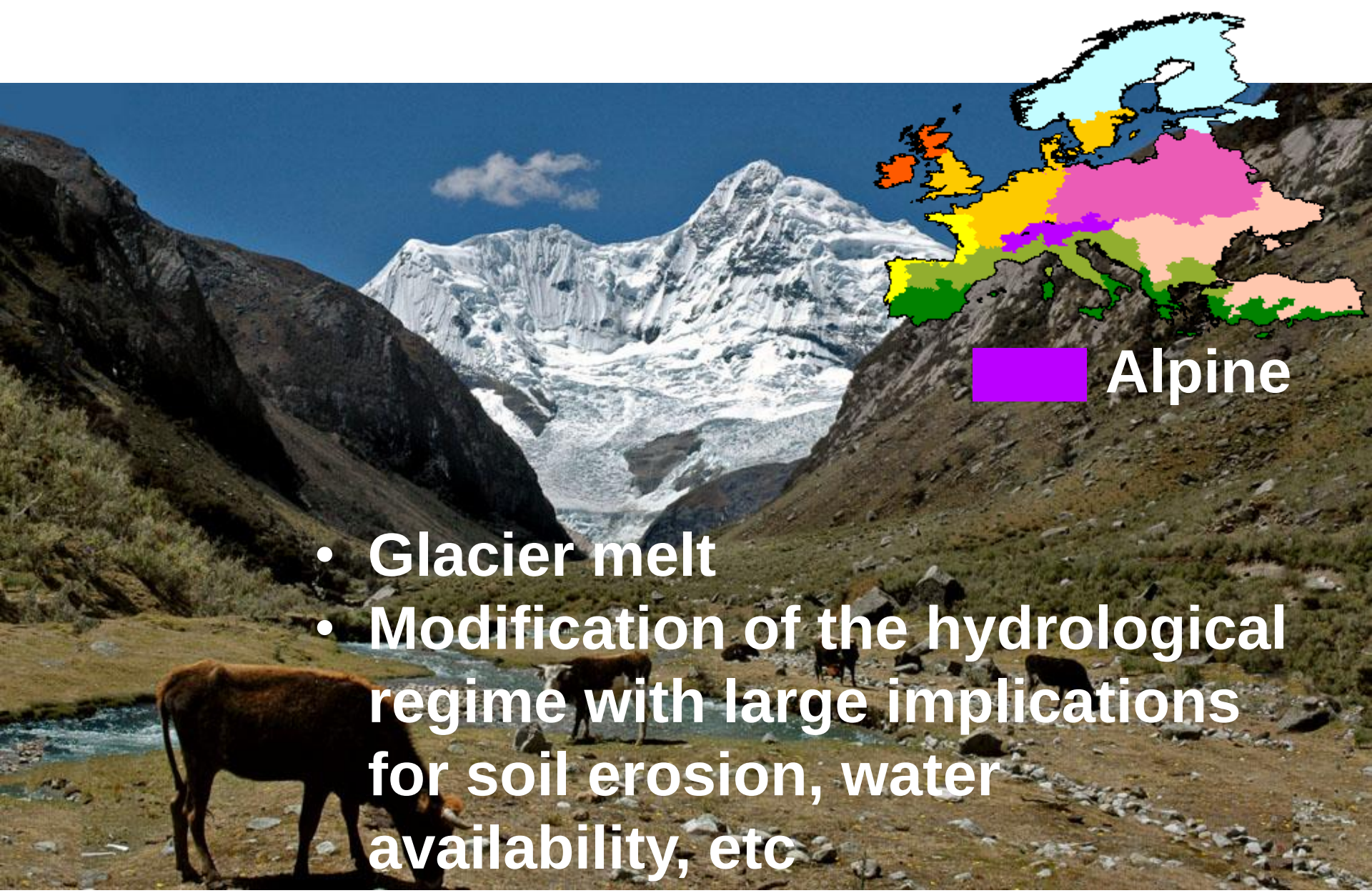




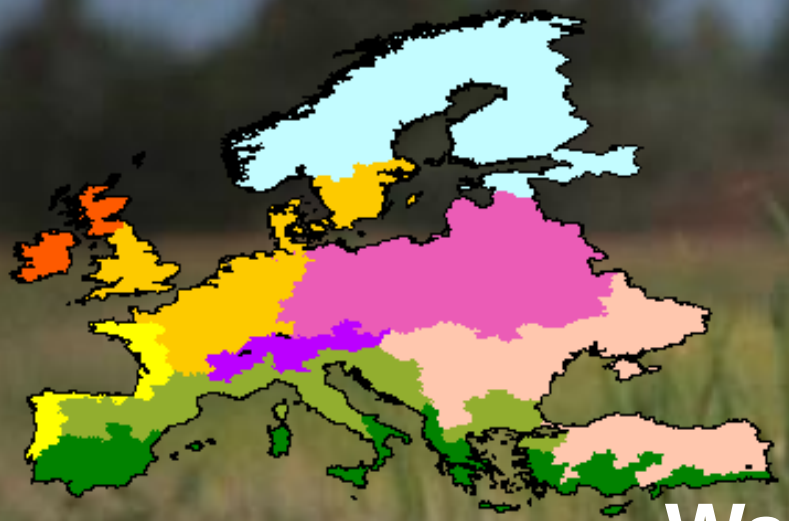
- Heat stress and drought in summer (e.g., 2007)
- Floods, water-logging
- Environmental degradation
- New crops, energy crops

4. Flexible risk management

- The past is not a reliable indicator of the future



- Glacier melt
- Modification of the hydrological regime with large implications for soil erosion, water availability, etc
- Further stress to highly vulnerable areas



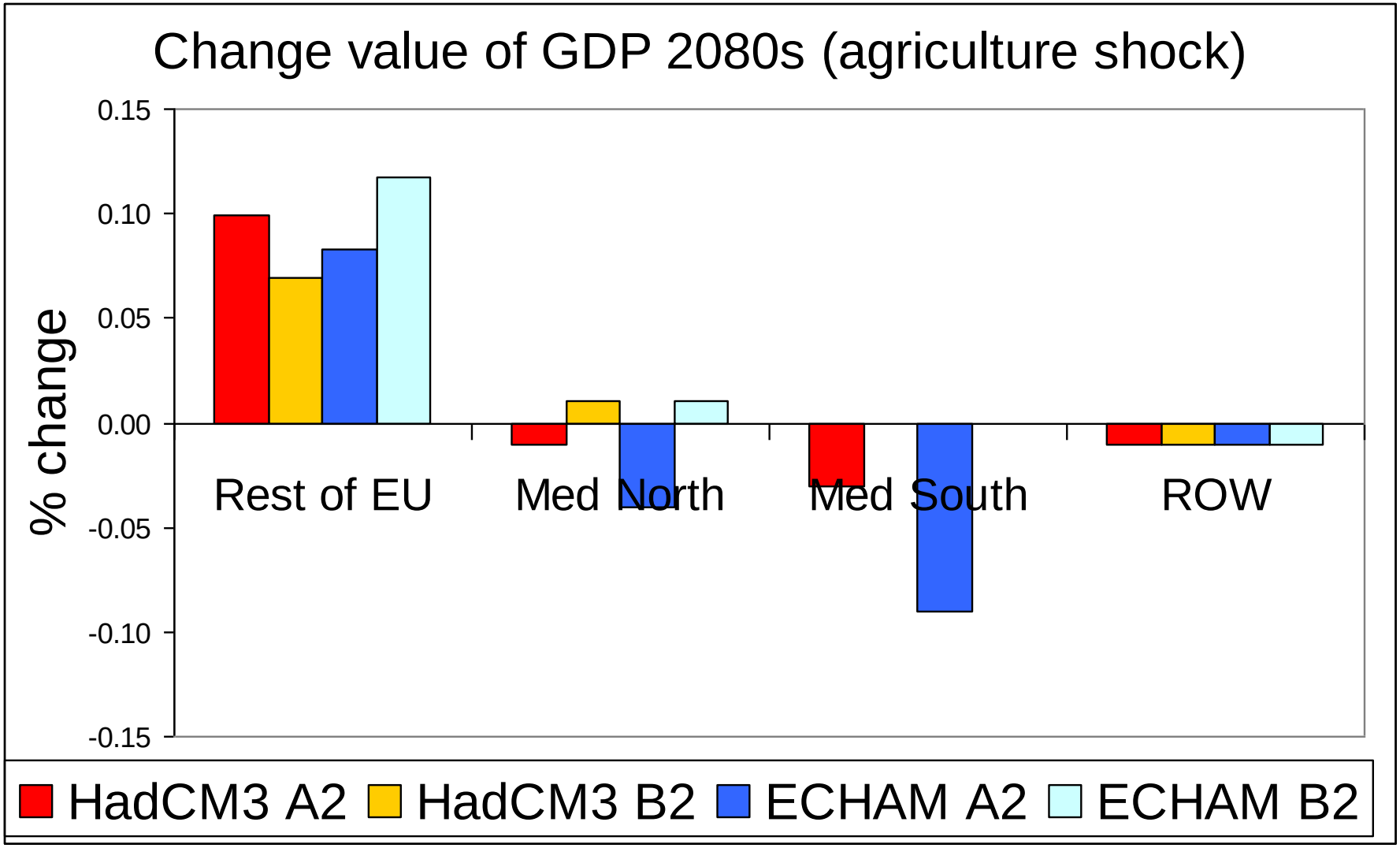
Med N

Med S

- Water scarcity and drought
- Conflicts among water users
- Vulnerability of the complex interactions of agriculture-ecosystems
- Limitations of rural development

The Stern Review of the Economics of Climate Change (Stern et al, 2006)

- Argues that “the overall costs and risks of climate change will be **equivalent to losing at least 5% of global GDP1 each year**”
- **Challenged** by many economists with large working experience in climate change (Tol, 2007). Ignores and contradicts numerous unquestionable results (Nicholls and Tol, 2005; Nordhaus, 2006; Sachs, 2001; Fankhauser and Tol, 2005)



Source: Iglesias et al., 2007

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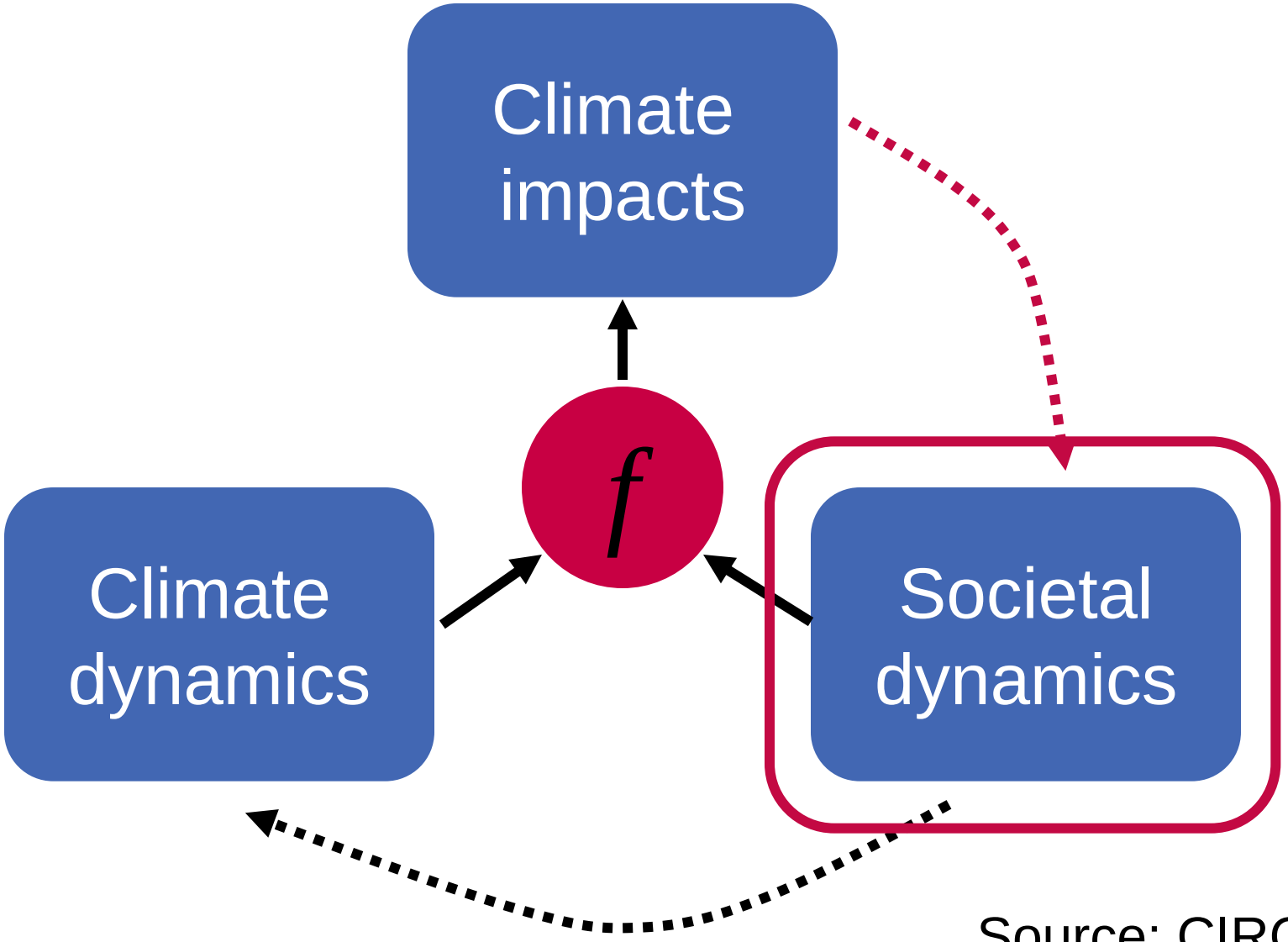


Source: CIRCE

Existing set of policies

- Kyoto protocol
- Lisbon strategy
- SD strategy
- **EU White Paper on Adaptation**
- CAP – WFD – Nitrates D – Energy D
- Local initiatives (early stages, dissemination, awareness building)

Building adaptive capacity

- Awareness raising
- Research (spatial and time dimension)
- Knowledge transfer
- Risk management
- Policy support in order to deliver adaptation actions

Delivering adaptation actions

- Supported by policy
- Strategic combination of the CC commitments of various policies
- Technology, infrastructure
- Changes in land use
- Flexible resource management and efficiency

Role of RD (CAP)

A flexible framework

Axis 1

- Farm modernization
- Restoring & prevention
- Farm advisory services
- Training

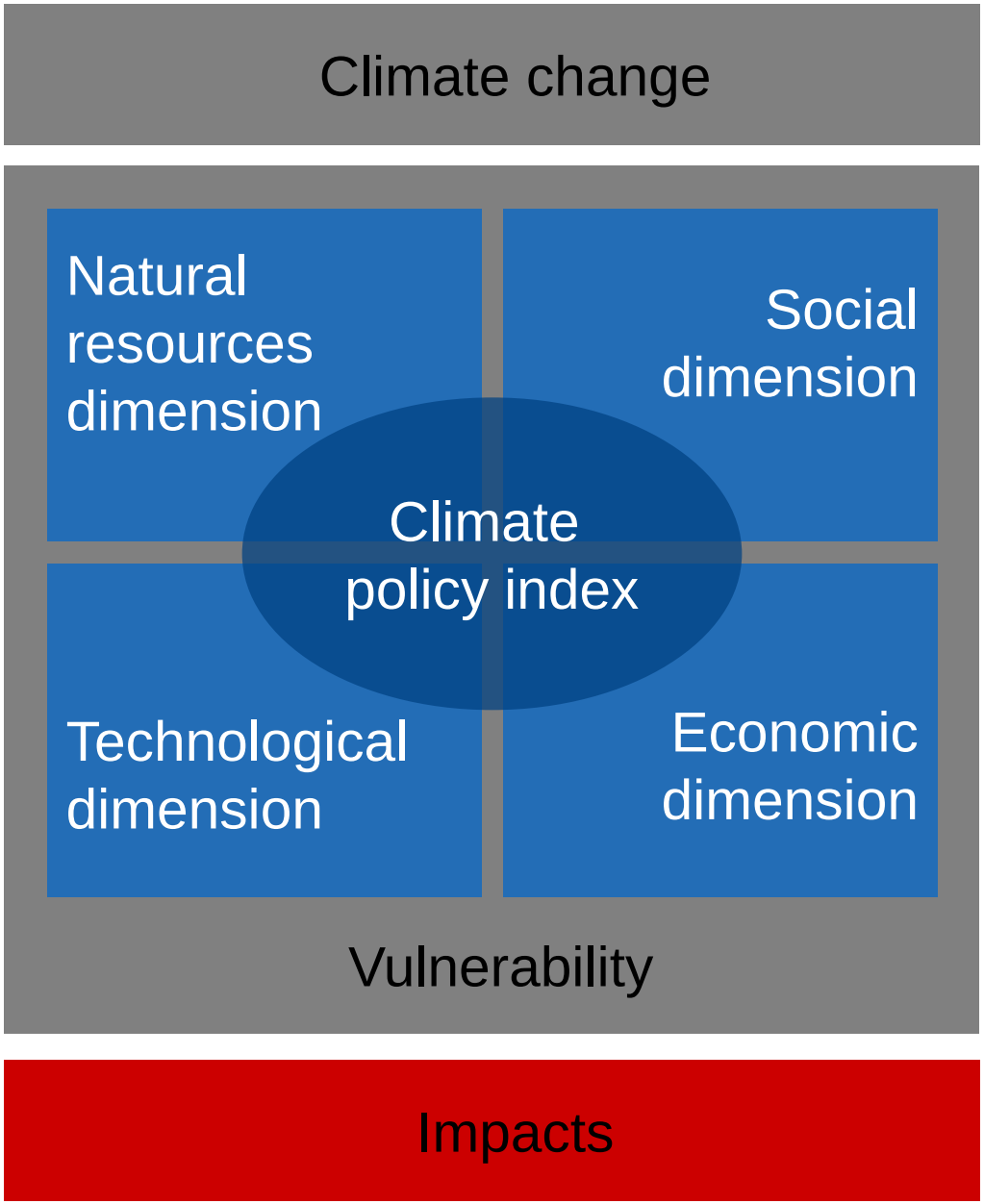
Axis 2

- Agri-env measures
- Payments linked to WFD

Axis 3

- Diversification into non-agricultural activities

Leader



5. Understanding how may policy modify climate risks

Define strategic combination of the climate change commitments in the various policies

Source: CIRCE

	Climate policy index
Algeria	0.31
Egypt	0.43
France	0.62
Israel	0.48
Italy	0.61
Libya	0.30
Morocco	0.40
Spain	0.55
Syria	0.49

- Values range from 0 to 1
- High values indicate that current policies decrease potential impacts (the system has increased adaptive capacity, is less vulnerable)

Source: CIRCE

Climate impacts on agriculture with different policies

HadCM3/HIRHAM B2 scenario for the period 2071-2100
(% yield change respect to baseline)

Agric output	Adaptation Policy Env (1)	Adaptation Farm (2)	Adaptation Policy Econ /Rural Dev (3)
Mediterranean Europe	**-50 to -25**	**1**	**0 to 20**

(1) Adaptation with emphasis on water resources protection and urban development
(2) Farm adaptation without policy support (private)
(3) Adaptation with emphasis with protection of agricultural production and rural development

Soure: Iglesias et al 2007


What is the best future
we can hope for?

Thinking more about …

1. Climate scenarios are not enough
2. Understanding of local vulnerabilities
3. Useful knowledge (involving practitioners, industry)
4. Moving towards a flexible, risk management
5. Understanding how policy modifies climate risks and opportunities

- Learning how to respond in the long term
- Learning how to avoid political crisis

Thanks for your attention!

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